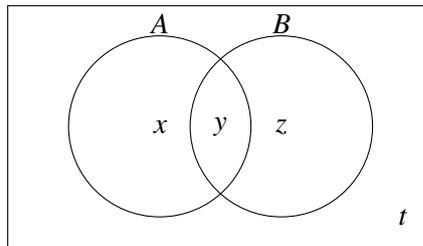


Finite Math, MATH 1100-R07
Fall 2022

Written Homework 1

Due Tuesday, September 27

- Let $A = \{0, 2, 4, 6, 8\}$ and $B = \{1, 3, 5, 7\}$ be two sets with universal set $U = \{0, 1, 2, \dots, 8\}$. Find:
 - $A' \cap B'$.
 - $(A \cap B)'$.
 - $(A \cup B)'$.
- With reference to the figure below, find x, y, z, t such that $n(U) = 50$, $n(A) = 25$, $n(B) = 13$ and $n(A' \cap B') = 12$.



- A recent survey of 150 investors revealed that:
 - 111 invested in stocks;
 - 98 invested in bonds;
 - 100 invested in certificates of deposit;
 - 80 invested in stocks and bonds;
 - 83 invested in bonds and certificates of deposit;
 - 85 invested in stocks and certificates of deposit;
 - 9 did not invest in any of the three.

How many invested in stocks and bonds and certificates of deposit?

[Hint: draw a Venn diagram with 3 sets. Introduce the variable x to be the intersection of the 3 sets. Then fill out the numbers in each region in the diagram in terms of x using the data provided. Finally, write down an equation in terms of x and solve it.]

- Suppose $P(E) = 0.26$, $P(F) = 0.41$ and $P(E \cap F) = 0.16$. Find the following:
 - $P(E \cup F)$.
 - $P(E' \cap F)$.

(c) $P(E \cap F')$.

(d) $P(E' \cup F')$.

5. Two dice are rolled. Find the probability of the following events:

(a) at least one of the dice shows a 6 or the sum is 11;

(b) the sum is no more than 10.

6. A survey of patients that visit a primary care physician's office results in the following data: 35% require neither lab work nor referral to a specialist, 30% are referred to a specialist and 40% require lab work. Determine the percentage of patients that require both lab work and referral to a specialist.

7. The 2010 American Community Survey estimates that 14.6% of Americans live below the poverty line, 20.7% speak a language other than English (foreign language) at home, and 4.2% fall into both categories.

(a) What percentage of Americans live below the poverty line and only speak English at home?

(b) What percentage of Americans live below the poverty line or speak a foreign language at home?

(c) What percentage of Americans live above the poverty line and only speak English at home?

8. The following table summarizes the results of a survey on 20,000 individuals, who were asked if they had health coverage and how they described their health status:

	Excellent	Very good	Good	Fair	Poor
No health coverage	459	727	854	385	99
Health coverage	4,198	6,245	4,821	1,634	578

(a) What percentage of individuals do not have health coverage?

(b) If we draw one individual at random, what is the probability that the respondent has excellent health and does not have health coverage?

(c) If we draw one individual at random, what is the probability that the respondent has excellent health or does not have health coverage?